

ABSTRACT

A device and methods for monitoring status of at least one cell, wherein the cell has a membrane forming a substantially enclosed structure and defining an intracellular space therein. In one embodiment of the present invention, the device includes a first substrate having a first surface and an opposite second surface, a second substrate supported by the first substrate, the second substrate having a first surface, an opposite second surface, a body portion between the first surface and the second surface, a first side surface and an opposite second side surface, wherein the body portion defines a first passage between the first side surface and the second side surface and an opening on the first surface of the second substrate and in fluid communication with the first passage, and sidewalls positioned above the first surface of the second substrate. In one operation mode, when a first medium is introduced into the first passage, the intracellular space of the cell is in fluid communication with the first passage with the first medium, a sensor measures the response of the cell to the first medium.